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REPORT OF A CASE OF IRIDO-CHOROIDITIS WITH SYMPATHETIC IRRITATION OF THE FELLOW EYE.

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Four years ago W. G., then a lad of 14 years of age, consulted me for keratitis and plastic iritis of the left eye. The pupil was occluded and there was synechia posterior. I do not recall his treatment, but he passed from my observation until July, 1886, when I found the cornea nebulous at points, also synechia anterior, general and radiated injection of the conjunctiva, new formed vessels in the cornea at points, the eyeball painful on pressure in the ciliary region with pains radiating over the forehead, on the side of the nose and in upper jaw on left side of face. The tension was normal. His pain was worse at night, but I could detect no signs of syphilis. His right eye now pained him, and he could not see perfectly with it and he saw motes floating before this eye, and there

was photophobia, and pressure in the ciliary region gave pain. Its pupil was active, the cornea clear, with some irregular injection of the conjunctiva, the lens and media were clear; but the retina and optic papilla were hyperæmic, and there was no disease of the choroid.

I advised enucleation of the left eye, which was done the following day. As has been my custom for ten years, the patient was placed under the continuous influence of morphine and chloral, to relieve the pain in the orbit and of the right eye, in this case. This was kept up for five days, when he no longer had pain.

No sutures were employed to close the capsule of Tenon, and the cavity of this capsule and the conjunctival cul-de-sacs were washed out several times daily with Panas' disinfectant fluid. Ice water was applied to the left eye. The room was darkened and the patient kept quietly in bed. Sympathetic inflammation did not result in the fellow eye, and the boy made a good recovery and now sees perfectly with the right eye. The left orbit was tender for several weeks after the operation, so that an artificial eye was not inserted for a month subsequent to the removal of the eyeball. He now wears the eye constantly and without inconvenience.

After removal the eyeball was placed in Müller's fluid for six weeks, then cleared out in an aqueous solution of chloral hydrate, grs. xx to ℥i. It was then frozen and divided horizontally and antero-posteriorly, from the center of the apex of the cornea to 2 mm. above the optic nerve. A posterior segment was then made of the hemisphere containing the optic nerve, and this segment was again divided longitudinally through the optic papilla and nerve. These several sections were placed in celloidin until saturated, and then in a 70 per cent. solution of absolute alcohol. After this hardening process was completed, they were placed in a microtome, and thin sections made, and these were cleared in oil of cedar and mounted in glycerine. Figs. 7 and 8 are micro-photographs taken from corresponding slides prepared in this manner.

Microscopical examination of the specimens:

Fig. 7 does not show the details as well as *the* slide, when seen microscopically, and hence the appearances as seen with this instrument will be given and the figures employed to aid the description.

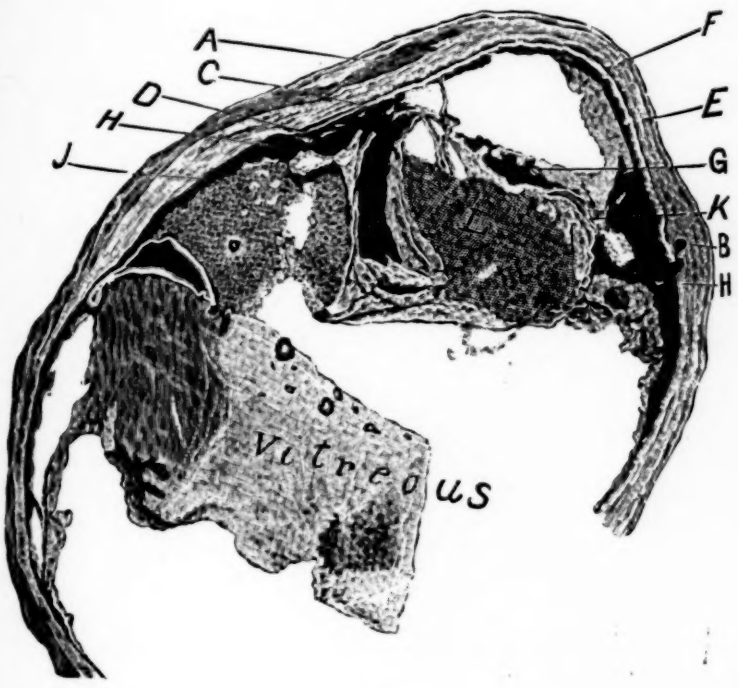

Fig. 7.

The fibres of the cornea are abnormally wavy, and its epithelium is lacking at points. The external elastic layer can be defined and it, the true cornea, and the epithelial layer are infiltrated with pigment and leucocytes at points. At A is seen quite a large deposit of pigment with separation of the fibres of the cornea, and at B another deposit, and about this, the internal elastic layer is pressed outward in an angular form. This latter deposit is in the region of Schlemm's canal on the right side. At D, Schlemm's canal is imperfectly

open, and there is a linear opening running from C to D. The internal elastic layer can be seen at F, and it is deeply infiltrated with pigment The iris, E, adheres to the membrane of Descemet throughout its entire extent in this section, and the pupil is closed. At G are seen deposits of pigment, extending to the left, upon the anterior capsule of the lens, which no doubt indicate former synechia posterior, which have been separated when the iris was forcibly cast forward and became attached to the cornea by the flow of fluids from behind forwards during the progress of the disease.

The stroma of the iris is broken at points, and at some parts of this membrane portions are separated from the body of this structure. Again, at points the fibres project into the true cornea, crowding aside and pressing before such fibres the internal elastic layer. The anterior and posterior surfaces of the iris are very irregular in outline. At many points the pigment is wanting in this membrane, and here deformed leucocytes can be seen. The texture of the iris cannot be distinctly made out in the microscopic and hardened preparation.

The ciliary body is ruptured and portions of the ciliary processes are separated from the main body; the pigment is wanting at points in the processes and the entire ciliary body is infiltrated with pigment granules and deformed leucocytes. At some parts the fibres of this muscle can be seen, but their outlines are indistinct, and pigment is freely deposited among these fibres. The ciliary processes H. H. are adherent to the deformed capsule of the lens, and only a few of the fibres of the suspensory ligament can be seen, and these are found at points of rupture of the capsule of the lens, and in the area of which openings, the lens-fibres are seen directly applied to the ciliary body. There is no opening between the lens and ciliary processes shown in this preparation, Fig. 7., which would permit the transit of fluids from the vitreous to the anterior chamber. However in another specimen, taken from a lower section of this eye, there is a clear opening between the sclerotic, choroid, and ciliary body, into the anterior chamber of the eye, on the right side of said section, but no

such space is apparent on the left side of that specimen. This then is the channel of communication between the vitreous and anterior chambers. In this latter section the iris is shown to be adherent to the lens, but not to the cornea. In Fig. 7 at J the ciliary body is separated from the sclerotic on the left, but not so on right side. The lens capsule is indistinctly seen in Fig. 7., but is clearly shown under the microscope, and it surrounds the lens in distorted folds, sometimes applied against the lens substance, again separated from it. The lens, L, is deformed, and there are fractures through it. Its fibres can be made out readily, and among these are numerous leucocytes, granular matter, and not infrequent deposits of pigment in masses and granules. I am unable to detect any lens cells, probably from the effects of reagents employed in the preparation of the eye and from the results of the intra-ocular disease.

The vitreous body contained several deposits of blood, which were present when the frozen eye was divided. These were so large as to involve the central portion of *this* body. At the periphery of the vitreous, both in front and behind, there are seen connective tissue and fine elastic fibres. There are also seen a number of blood vessels, both veins and arteries; also deformed red and white corpuscles, and fine and coarse pigment deposits as well as epithelium. In one section the vitreous is separated from the choroid in its entire extent, some of the latter adhering to the vitreous and a portion to the sclerotic. The retina is carried with the vitreous. These details are not seen in Fig. 7, but are shown plainly by another section in my possession, while viewed under the microscope. The fibres of the sclerotic are wavy, and its stroma is infiltrated with pigment.

In one of these sections the retina is well shown. It is crowded forward nearly as far as the lens. The internal limiting layer is not shown, but the layer of optic nerve fibres, the ganglion cells, the internal and external molecular, the internal and external granular layers, the external limiting membrane (imperfectly), the layer of rods and cones and the pig-

ment layer (imperfectly) are seen. All these textures are injured histologically from the effects of the severe inflammation which involved the eye.

This disease seems to have been more active in the vitreous and choroid than in the retina. However, we find in the retina deposits of pigment, leucocytes, deformed red globules and epithelium.

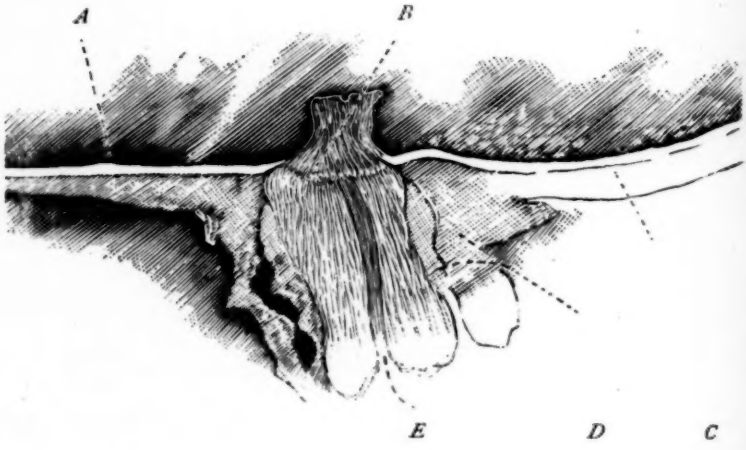

Fig. 8.

A. Choroid.
B. Optic nerve and cribriform fascia.
C. Sclerotic.
D. Optic nerve sheaths.
E. Central canal of the optic nerve.

Fig. 8 illustrates a vertical section through the optic nerve and its sheaths. It shows the optic papilla elevated above the level of the choroid, the upper extremity of which has been divided transversely to the axis of the optic nerve in obtaining the section. Beneath this nerve-head and on a level with the choroid is the cribriform fascia, darkened with the deposit of pigment. The optic nerve fibres are seen running distinctly throughout the nerve, and among these can be seen a

limited deposit of pigment granules, and at two points, in small masses; but there is no pigment or leucocytes in the central canal, or in those of the optic sheaths. I am not able to state that the central artery and vein of the optic nerve are pervious. These can, however, be seen beyond—behind—the level of the cribriform fascia. The contracted nerve-head has, I believe, closed the caliber of these vessels, at least in front of the cribriform fascia.

REMARKS.—This case presents an example of inflammation of all the interior parts of the eye, leading on to its destruction for visual purposes, the disease beginning in the cornea and iris and probably spreading to the choroid, and involving it, the vitreous, retina, the optic papilla and nerve. The case presents none of the features of glaucoma. On the contrary, the papilla is elevated instead of depressed, and there is no evidence of increased tension. The case is chronic in character, but towards its termination the eyeball becomes painful, involving the ophthalmic branches of the trifacial and other divisions of the fifth nerve. The morbid influence still continuing, the right eye became quite painful, intolerant of light, and its sight impaired. The left eyeball is removed, and the right eye recovers its functions. It is seen in this left eye that the long ciliary nerves still preserve their course unbroken, but unquestionably they are subjected to the influence of the choroiditis about them. So that in cornea, iris and in sclerotic these nerves are capable of being influenced by morbid agencies, and hence the manifestation of pain not only in this eye, but the fellow eye. There is no evidence in this case of transmission of morbid materials through the optic nerve or its central canal or external spaces.

CATARACT OPERATIONS IN NEW YORK.

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Until about a year ago the method of cataract operation which was almost universally accepted was that known as the "Von Graefe Modified Linear Extraction" with iridectomy Of late some of our oculists have been operating without an iridectomy.

As there is considerable diversity in the details of the operations, the different methods are here described.

Dr. Knapp has been operating by a method which is essentially that of Panas, of Paris. The details are as follows:

The patient is seated in the operating chair, the doctor standing behind. Aænsthesia is produced by one or two instillations of a four per cent solution of cocaine. Antiseptic precautions are adhered to throughout. The hands of the operator and assistants are washed in Panas' fluid:

℞ Hydrargyri biniodidi, - - - - 0.05
Alcoholis, - - - - - - 20.00
Aquæ, - - - - - - 1200.00

A solution of bichloride is sometimes used 1:5000. The integument around the eye is washed with soap and water, especial care being taken to cleanse the brows and lashes, the presence of hair forming a favorable nidus for the development of bacteria. The eye is then bathed with Panas' fluid, the upper lid being turned, and especial care being taken to reach the fornix and all parts of the conjunctiva. All instruments are

dipped into the biniodide solution, wiped dry and bright, then dipped into the fluid again just before being used. The patient is seated in the operating chair before the window, and, unless the day is very bright, the light is condensed on the eye with a reading glass held by an assistant. On dark days artificial light is used.

Everything being in readiness, the speculum having been introduced, the section is made with the narrow Von Graefe knife, the right hand being used for the right eye, the left for the left, the fixation forceps being held in the other hand. The puncture is made at the selero-corneal margin a little above the horizontal meridian of the eye, the counter puncture at a corresponding point opposite. The section is completed by cutting upward with a sawing motion not quite parallel to the corneal margin. The upper part of the incision is about one-fourth the distance from the upper margin to the apex of the cornea. The incision includes about one-third of the cornea. Just before completing the section, the edge of the knife is turned forward so as to come out as near as possible at right angles to the surface of the cornea, thus providing for better coaptation of the edges of the wound, and avoiding a conjunctival flap. There is no iridectomy. The anterior capsule of the lens is thoroughly lacerated with the cystotome. The lens is pressed out in the usual manner, a hard rubber scoop in one hand pressing against the lower part of the cornea. After the delivery the speculum is removed, and the anterior chamber allowed to refill. The cortex is pressed out with the thumb through the lower lid, sometimes with a scoop stroking the cornea, or a small spatula may be introduced into the wound. Should the iris become engaged in the wound, it may be replaced by stroking the cornea. Should these efforts not be successful, the eye is closed for a few minutes until the aqueous accumulates, when they are repeated. Should it not be possible to replace the iris, an iridectomy would be necessary. When the iris is replaced, antiseptic fluid is injected into the wound, perhaps into the anterior chamber. In some cases a few drops of a one per cent so-

lution of eserine are instilled. Quite often the ability to count fingers is tested before bandaging the eye. The dressing is as follows: First a layer of antiseptic gauze covered with a one and a half per cent ointment of benzoate of mercury, then a layer of cotton wetted with antiseptic solution, then a layer of dry cotton. The other eye is dressed with cotton only Over all a flannel roller is placed. Dr. Knapp has had forty-eight cases by this method. The results have been quite favorable. The vision is generally a little better than after the operation with an iridectomy. Iritis is more frequent, and is sometimes followed by adhesions. The central pupil is an advantage. He thinks it probable that this will be the operation of the future.[1]

Dr. Agnew uses no speculum. The lids are held apart by the hand of the operator. The globe is held steady by placing a finger against it. This also serves to keep the aqueous from escaping under the conjunctiva which is sometimes pushed before the point of the knife. When the point of the knife is engaged in the opposite side the lids may be let go. Antisepsis with bichloride solution. Anæsthesia by means of cocaine. The section is made by entering the knife 1 mm. behind the clear cornea a little below the horizontal meridian. The counter-puncture lies at a corresponding point opposite. The section is downward, the apex being half way between the pupillary margin and the lower border of the cornea. This is the old Liebreich incision. No iridectomy is made. The anterior capsule is lacerated completely. The delivery is accomplished by pressure, first directly backward on the upper side of the cornea, then toward the center of the globe and downward. This manœuvre tilts the lens forward into the aperture, and then forces it out through the incision, the lower border of which is pressed backwards to facilitate the escape of the lens. After the delivery the anterior chamber is allowed to refill. The cortical substance is forced out by pressing through the lids. The

[1] For further particulars of Dr. Knapp's method of operating, statistics, etc., the reader is referred to Dr. Knapp's paper on the subject in the March number of the *Archives of Ophthalmology*, Vol. xvi, No. 1, pp. 54 to 71.—[Editor.]

dressing is as follows: The lids are first covered with vaseline, and absorbent cotton is placed over both eyes. A flannel roller is then applied, and over all a black shade tied with tapes. No drops are used.

By this method only two instruments are introduced into the eye. In some of the cases the visual results are perfect. The incision downward is easier to perform, but if an iridectomy should be necessary, it is not the most favorable location.

Dr. Noyes operates in selected cases without an iridectomy. The eye and surrounding integument are thorougly bathed with antiseptic fluid, bichloride or boracic acid being used. The conjunctiva is washed with biniodide 1:20,000, or a one per cent solution of salt in water that has been boiled and filtered. The section involves two-fifths of the cornea. The puncture and counter-puncture are in the clear margin. The cut is made by depressing the handle of the knife, using the point of puncture as a fulcrum, then elevating the handle and cutting with the heel of the knife, avoiding a sawing motion as much as possible. No conjunctival flap. The anterior capsule is thoroughly lacerated. He sometimes dispenses with fixation. To deliver, pressure is made with small curettes or spatulæ, one above the edge of the wound, the other on the cornea. Sometimes the speculum is removed and pressure made through the lower lid. Generally the cortex is removed in this way. Should the iris prolapse, it is replaced with the spatula. Eserine, one grain to the ounce, is then dropped into the eye. During the operation the eye is irrigated more or less according to the amount of bleeding, the antiseptic being forced over the eye from a bulb-syringe by an assistant. After the extraction the vision is generally tested with fingers. In dressing the wound, a layer of cloth covered with vaseline is first placed over the closed lids, over this absorbent cotton is packed, then a flannel roller. The doctor thinks the method without an iridectomy of very limited application.

In performing an iridectomy the ball is fixed by an assistant. The cut is made by one clip, the scissors approaching from over the cornea instead of from the side, thus cutting from before backwards, making a small iridectomy.

Dr. Roosa, after introducing the speculum and fixing the eye below, makes the section upward with the Von Graefe knife, wholly in the cornea, comprising one half of its circumference. When the section is about half completed, the back of the knife is turned towards the lens. Some pressure is made backward in order to rupture the zonule of Zinn and thus dislocate the lens. The section is then completed. The lens is pressed through the incision. No iridectomy is performed. This brings the lens out in its capsule and leaves a clear central pupil, obviating the necessity of a secondary operation, and producing the best visual results. This method is like Pagenstecher's in that the capsule is removed with the lens, but the *modus operandi* is essentially different. In some cases it has been found necessary to perform an iridectomy. The doctor complains that none of his assistants adopt this method.

Dr. Pomeroy thinks the operation of the future is without an iridectomy. His idea is to use a modified Beer's knife, the blade to correspond in width to the width of the section. He has had six operations without an iridectomy with satisfactory results.

Dr. R. H. Derby operates only by the "Von Graefe Modified Linear Peripheral Method." This, he thinks, is the standard operation. When any superior method is demonstrated it will be time to adopt it.

Dr. Gruening reported, at a meeting of the New York Ophthalmological Society, four cases operated on without an iridectomy with very good results and smooth healing. At a later meeting he reported four more cases, in every one of which there was some complication due to the mode of operating.

In looking over the whole subject, it would seem that there is a wide difference of opinion in reference to the relative value of the different operations. It is generally conceded that to operate with an iridectomy is as safe as any method that has been suggested. The various other operations are still on trial. It will take some time to determine their value. One would naturally think that Von Graefe and other eminent ophthalmologists knew what they were about, when they aban-

doned the method without an iridectomy. The main objection to the latter operation is the tendency to iritis after the operation. This has been reported by most observers. With this is the danger of adhesions to the capsule. There is also danger of prolapse of the iris. This has occurred in some cases several days after the operation. The method that gives the best average results is the one that commends itself to conservative surgeons, not the one that is the most brilliant in a minority or even in a majority of cases. If in a minority, the effects are below the average by the other method. It is better that ninety-five per cent should be able to see to get about than that seventy-five per cent should be able to read the finest print and twenty per cent not be able to find their way. Judged on these principles the von Graefe method seems to hold its place as the standard operation. By this method the best operators lost two or three per cent by suppurative processes. It can hardly be expected that these results can be excelled. If they can be equalled by any method that leaves the iris intact, it will be an improvement. So far the number of cases operated on is too small to form any reliable conclusions, and the matter must be considered *sub judice*. The methods of removing the lens in the capsule, heretofore proposed, have never received any considerable support from ophthalmic surgeons.

By the various new methods it is hoped to preserve the iris intact with a clear central pupil. This will give a better visual result, and, if it can be done safely, will be of immense advantage to our patients.

CHANGES IN THE FUNDUS OF THE EYE IMMEDIATELY AFTER DEATH.

BY LUCIEN HOWE, M.D., BUFFALO.

The circumstances which attend a death bed are ordinarily of such a nature as to render exact observations difficult. For this reason I have less hesitation than I would otherwise, in detailing a single case in which I had an opportunity of watching the changes in the fundus of the eye, immediately after dissolution.

When making my morning visit at the Franciscan Hospital, Pine street, on June 27, 1880, it happened that one of the patients in the general ward was in a moribund condition. This was a man about 54 years of age, who suffered from phthisis pulmonalis. To avoid the depressing effect of his death upon other patients he was removed to a smaller room which was properly darkened.

My observation began at twenty minutes past four. At that time the patient was totally unconscious; no pulse at wrist, heart beat at 110, respiration laboring at 28 per minute.

The eyes were upturned and immovable; cornea clear, pupils slightly dilated. The ophthalmoscope gave the usual reflex from the fundus of the eye, but all the features of the retina could not be clearly distinguished. A solution of atropia, two grains to the ounce, was therefore applied.

4:45 P. M.—Respiration irregular and gasping. No pulse at wrist. Heart beating feebly at 120. The left pupil now begins to dilate, and in the inverted image the features of the retina are as follows: color normal; outline of nerve indistinct; vessels normal; no pulsation of them visible.

4:50 P. M.—Respiration slower, accompanied by a peculiar noise in the throat.

4:51 P. M.—Retina apparently a little paler. Respiration gasping at 18 per minute.

4:55 P. M.—After a cessation of respiration for fully fifteen seconds patient made one deep inspiration. The accompanying expiration lasted an unusually long while, and then ceased. The heart's action had now also stopped and the patient was dead. No change in the appearance of retina.

4:57 P. M.—Retina same.

5:01 P. M.—The edge of papilla which before was indistinct, now clearer, and the entire fundus paler.

5:03 P. M.—Same as at 5:01.

5:07 P. M.—Vessels not clear on papilla.

5:08 P. M.—Whitish lines across the pupil in every direction, rendering a clear view of the fundus impossible, but the entire reflex much whiter.

5:09 P. M.—Oblique illumination shows the cornea to be thrown into folds as if half collapsed. Tension of globe normal.

5:12 P. M.—Right eye in the same condition as left.

5:20 P. M.—[About]—The day light having been admitted to the room, the reflex is almost white, but it is impossible to distinguish the different features of the retina.

In spite of the long time that has elapsed I have had no equally good opportunity to corroborate this sequence of changes by similar observations, still it is pertinent to mention that I examined ophthalmoscopically the eyes of a murderer, Carl Manke, about twenty-eight minutes after the drop fell. The condition presented was in every way similar to that in the case narrated at the end of twenty minutes after death. There was no perceptible rupture of the lens, as has been described in cases of hanging, by Dr. Dyer, of Pittsburg; but the wrinkling of the cornea, which was perceptible only on oblique illumination, could easily have been mistaken for such a fracture of the lens.

An interesting question arises in this connection as to the length of time the visual purple persists after death in the hu-

man subject. Of course the light ordinarily employed would itself hasten the bleaching, but with the aid of a sodium flame properly arranged, it would be possible to study the changes quite satisfactorily.

THE ORTHOPÆDIC METHOD OF TREATING PARALYSIS OF THE OCULAR MUSCLES.

BY ADOLF ALT, M. D.

In the November number of *Zehender's Monatsblaetter fuer Augenheilkunde* of 1877 Prof. J. Michel, now of the University of Wuerzburg, for the first time advised an orthopædic method of treating paralysis of the ocular muscles. He described this method in the following words: "The conjunctiva near the corneo-scleral margin and over the insertion of the paralyzed muscle on the eyeball being grasped with the common fixation-forceps, the eyeball is dragged in the direction of the sphere of function of the paralyzed muscle and as far as possible beyond its ordinary limit of contraction, then again backwards. These movements back and forth are made for about two minutes at the time. The effect of this manipulation is greatest and even astonishing right at once. The addition, the gain in the faculty of contraction is at least one and a half millimetres. The effect is gradually reduced, so as to equal on an average a prism of from 12° to 16° about one hour after this manipulation. * * * One such manipulation every day seems to be sufficient. * * *

The main advantages of this treatment are: 1. The elimination of the action of the antagonistic muscle. 2. The shortening of the necessary period of treatment." * * *

Although it might appear from the foregoing that Michel wanted to substitute this orthopædic method of treatment as a superior one for the methods formerly in use, he states in his Compendium on Ophthalmology[1] that "in a number of cases

[1]Lehrbuch der Augenheilkunde von Dr. Julius Michel, Wiesbaden, 1884, pp. 107 etc.

of paralysis the orthopædic method by means of passive movements may be used with advantage." And, further on, "both methods, the electrical and the orthopædic one, are to be used conjointly."

From this it appears that the orthopædic method alone has not proven all that might have been expected after his first communication. This has also been my experience. Yet, I am satisfied that the orthopædic method by passive movements is a valuable one in the treatment of paralysis of the ocular muscles, and that it should always be tried in conjunction with other treatments which may be appropriate in the case in hand. Before we had cocaine, the pain caused by this treatment was enough to frighten some patients away. With cocaine the manipulation is far from being painless, especially in its after-effects, but it is so much less so than in former years, that most patients willingly submit to it.

In the following, a few cases in which the orthopædic method was applied, are detailed.

Case I. H. W. C. L., æt. 49, has had syphilis when a young man. Had stricture of the right nasal duct. Complained of weak eyes for several years. Double images had gradually developed to an alarming extent during the last four months. When he consulted me I found a moderate ptosis of the right upper lid and paralysis of the rectus superior and the rectus externus of the same eye. Fundus and vision were normal. He complained of no other symptom but headache. I ordered large doses of iodide of potassium, and treated him with electricity. The result of this treatment being nil, except with regard to the ptosis, which disappeared, I began with the orthopædical treatment by passive movements of the affected muscle. Although this treatment was persisted in for two months, no improvement took place. About a year later on, as the paralysis remained unchanged, I proposed tenotomy, but the patient would not consent.

Case II. B. B., æt. 44, consulted me on account of double vision which he had felt coming on a week before he saw me. I found paralysis of the left abducens muscle. The knee-reflex

was decidedly exaggerated. Both optic nerves were pale and the retinal arteries rather thin. Suspecting a beginning spinal affection, I sent him Dr. to Bremer, of this city, for a general examination of his nervous apparatus. However, nothing definite was elucidated, beyond the probability of a coming spinal trouble. He most emphatically denied ever having had any syphilitic affection. He was given the iodide of potassium in increasing doses, and I treated the paralyzed muscle by passive movements. After eleven such treatments the activity of the muscle was perfectly re-established. I do not know anything of the further history of the patient.

Case III. Mrs. M. M., æt. 41, came to consult me three weeks after having had a severe accident. While going down the cellar-stairs she slipped, and fell so unfortunately that she found herself hanging on a large meat-hook fastened in the wall, which had entered the orbit under the right upper lid. Severe hæmorrhage and inflammation followed, and when the latter had subsided, she could not raise the lid voluntarily, and saw double, when lifting it with her hand. I found a complete inactivity of the levator palpebræ superioris; the lid could be moved slightly, however, by the action of the frontalis muscle. There was also a restriction of the action of both the rectus superior and rectus internus. A stellated scar on the conjunctiva bulbi marked the entrance of the hook. Passive movements, massage and electricity proved all useless, although continued for two months. No change has since occurred. The operative measures which were proposed as a last resort, were not consented to by the patient.

Case IV. S. L. æt. 29, consulted me about double vision which he had noticed for about one week. I found complete paralysis of the right external rectus. He had never had syphilis. The patellar reflex was considerably exaggerated on the left side. He confessed continued excess in the sexual sphere. I at first advised cold douches down the back, followed by friction, and used the faradic and constant current. No improvement being noticeable after one week, I proceeded to the passive movements, and gave him besides some iodide

of sodium. By this treatment he improved at once, and in five weeks, when he left the city, barely a trace of the former trouble could be noticed.

Case V. A. K. æt. 51, was sent to me in consultation on account of double vision, which he noticed for the first time on the day before, when getting up in the morning. He had been infected with syphilis about a year previously, and he had had skin symptoms six weeks after the primary sore. I found ptosis of the left upper lid, and paralysis of the internal rectus and paresis of the superior rectus of the same eye. He had been under antisyphilitic treatment of some kind almost throughout the year since he had been infected. He was ordered large doses of iodide of sodium and inunctions of the 20 per cent. oleate of mercury. To these I added at once passive movements of the internal rectus. The pathological symptoms gradually disappeared under this treatment in two months' time. In the second month I also applied the constant current. The ptosis disappeared first, the paralysis of the internal rectus last.

TRANSLATION.

In the January number of the *Archives d' Ophtalmologie*, Panas has an interesting paper on "Considerations on the Pathogeny of the So-called Serous Cysts of the Orbit, Occasioned by a Recent Observation." In this paper he gives the minute anatomy of a bilobular cyst he removed from the left orbit of a little girl æt. 12 years. As the results he has come to, appear to us of importance, we give here the résumé made at the end of his paper.

"The study of minute anatomy which precedes shows undoubtedly that we had here really to deal with a bilobular cyst, formed by a membranous wall containing acinous muciparous glands, with excretory canals lined with cylindric epithelial cells. Some mucus, somewhat modified by the admixture of elements of the blood, at least in the largest and probably the oldest of the two sacs, was all the cyst contained.

From this we have no other explanation than, that the formation of the cyst under consideration was in reality due to the fœtal incarceration of some of the mucous membrane of the fossæ nasales and the sinus, since it represents that structure almost exactly. This cannot be objected to on the ground that the epithelium, although it is cylindric, has no vibrating cilia, since the epithelium of the lachrymal duct and sac, although derived from the same mucous membrane, has none either.

The most characteristic condition is, however, the presence of numerous acinous glands similar to those of the mucous membrane, and added to this as the only contents of the cyst, a pure viscid mucus, which has become coagulated by the hardening fluids, like normal albumen.

Viewing now the topography of this cyst and its relations

with the walls of the orbit, we will come to the same conclusion, that it is of a dermo-mucous origin.

In fact, we know that this cyst and all those we find reported, and which are analogous to it, are situated invariably in the lower inner portion of the orbit, that is, just in that portion which is in connection with the mucous membrane of the fossæ nasales and the maxillary sinus. Is it not, therefore, infinitely probable that the one is derived from the other, the more so, since all the dermoid tumors of the orbit are derived from the external integument of the embryro, abnormally incarcerated, and later on separated from the derma from which they took their origin? We do not see any possibility to doubt this.

Let us see what the observations of others teach us, which, usually incomplete, were published before ours, and which we find here and there in the scientific publications.

In the case of orbital teratoma, observed by Boeer and Weigert, it is stated that "the cystic sacs in the substance examined, are lined with a ciliated cylindric epithelium, and that they furthermore posessed mucous glands."

In Kundrat's observation it was a colobomatous eye grown together with a cystic substance. The latter consisted of an immense number of small cysts, lined with a cylindric epithelium. Besides, there was, as in our case, a small quantity of cartilage.

Undoubtedly we could multiply these citations, but all the observations made before the time of histological studies and those the examination of which was made in an incomplete manner, or rendered defective by the bad conservation of the specimen, could not be of much value to our proposition, that is, the demonstration of the fact that these cysts are of a naso-mucous origin.

The future will fill the gap and our observation is only the beginning.

Talko and Hoyer already, when studying the microphthalmus with formation of cysts, have upheld the idea that the

cyst was independent of the eyeball and interfered with its growth.

Others, and among them our learned friend and former pupil, Van Duyse, have felt themselves authorized to think, that the cyst sprang from the eyeball, the evolution of which, in an unaccountable manner, had been interfered with. In proof of this, they mentioned that they found certain elements of the choroid and retina within the cyst. But why should it appear astonishing that a cyst derived from the nasal fossa and growing largely within the orbit before the ocular vesicle is closed, should grow together with it, not only so as to interfere with its development, but so as to exchange elements with it?

Is this not the way it happens in the ovary in which, by the side of a dermoid cyst we find serous cysts coming from the female organ, the evolution of which has been seriously interfered with by the dermoid?

By all these reasons we are tempted to side with Talko and Hoyer, as regards the ocular teratomata, and this gives a much wider range to the doctrine of the mucous origin of the naso-orbital cysts than may at first appear.

When once this pathogeny of the so-called serous cysts of the orbit will be finally accepted, the dense obscurity which now covers this subject will be removed, and we will have two well defined classes of congenital cysts of the orbit.

One will comprise the dermoid cysts, that is, those due to an incarceration of the outer integuments; the other, the mucoid cysts, derived fram the incarceration of the mucous membrane of the air-passages in the orbit.

Whether such cysts are small or big, simple or compound, pure or changed in character, in communication with the neighboring cavities or not, arrest the development of the eyeball or not,—all these can only be questions of degree and time in the development of the mucoid cysts of the orbit and nothing more.

The following report on *Cataract Produced by Naphtaline* was made to the Society of Biology of Paris by Bouchard and Charrin at its meeting, December 18, 1886, and is translated from the *Revue clinique d'Oculistique.*

"Last June we announced to the Academy of Medicine that naphtaline brought into the alimentary canal of rabbits in certain doses would cause the formation of cataract. Since then we have proceeded with these experiments in the laboratory of general pathology of the faculty of medicine; and the fact has again been established. We complete to-day our first communication by some new details.

If we cease to administer the naphtaline as soon as the cataract begins to make its appearance, this lesion usually progresses continually, and the lens becomes more and more dim. Both eyes are generally attacked in an almost similar manner. There are, however, some exceptions to this rule, as in this rabbit which we show here to the society.

The cataract appears in different cases at a different time; yet, it is but rarely not yet visible on the twentieth or twenty-fifth day after the beginning of the experiment.

Naphtaline has been administered in doses of one and a half or two grammes (from about twenty to thirty grains) a day, mixed with glycerine. Glycerine alone does not produce a similar lesion. If we calculate according to the weight, our rabbits weighing on an average two kilogrammes (four pounds), these doses for a man weighing seventy kilogrammes (140 pounds) would be equal to about thirty-five grammes (about one ounce and seventy-five grains).

Many animals during the experiment lose flesh, but usually they do not die, but soon get fat again after the administration of naphtaline has ceased. This white rabbit which we show to the society weighed 1,990 grammes (almost four pounds) on May 26, 1886, he weighs now more than three kilogrammes (six pounds) and you can see that he has a complete double cataract.

Other substances have been experimented with in order to produce cataract. The results were uniformly negative. These substances were the following ones: Naphtol (α. and β.), naphtylsulphite of sodium (A. and B.), naphtylamine, monosulphonaphtol, phenate of sodium, phenic acid.

The question naturally arises, why does naphtaline produce

cataract in the rabbit, when introduced into the alimentary canal? We can so far answer it only by a hypothesis. When introduced into the organism of the rabbit, naphtaline becomes combined with sulphites. It is found in a small quantity in the urine, but not as naphtaline, it is then naphtylsulphite (M. Rosenstiehl). We tried to find out whether this agent acted on the crystalline lens as naphtaline or as naphtylsulphite of sodium. Since these naphtylsulphites (A. and B.) are very soluble, it is easy to verify this hypothesis experimentally. These salts, even in very considerable doses, exert no influence on the nutrition of the lens. We, are therefore, induced to question whether naphtaline does not cause the changes in the lens by the fact, that it combines with the sulphur, and therefore acts on the globuline in a chemical way, in withdrawing from it a portion of the sulphur, it normally contains. In this case it would be necessary to see whether the other agents which combine themselves in the human economy with sulphur also produce a disturbance in the nutrition of the crystalline lens. For this purpose we have so far only used the phenate of sodium and the phenic acid. Although we have administered these substances for three weeks, the results obtained were absolutely negative.

It does, however, not seem to us as if we had, therefore, to abandon our hypothesis altogether, since we were forced on account of the very poisonous character of the phenate of sodium and the phenic acid, to give but very small doses. It may be,that this production of cataract will be of some practical consequence in the hands of ophthalmologists (artificial ripening of cataract, studies with regard to the nutrition of the lens, experimental extraction of the cataract in animals, etc.)."

The following article by Prof. A. Eulenburg in Berlin, on *Episcleral Faradization and Galvanization of the Ocular Muscles* is taken from Hirschberg's *Centralblatt fuer prakt. Augenhlkde.*

The episcleral, so-called direct, method of electric irritation of the ocular muscles, although used among others by Fieber,

Gozzini, Rosenthal, Brudenell Carter (after operations for strabismus) and strongly advocated by me already seventeen years ago, has so far not been able to gain favor more generally. In electo-therapeutical as well as in ophthalmic reports we meet almost universally with the "indirect" or "percutaneous" (more correctly transpalpebral) method, which by Benedikt, without apparent reason, has been described as the "reflex-irritation" of the ocular muscles. The episcleral method on the other hand is either not mentioned at all, or not accepted on account of the erroneous idea of painfulness and a too powerful irritation of the conjunctiva, and, since it is thought, that we can get along as well without it. This prevailing opinion has again been promulgated more recently by von Ziemssen (5th edition of his "Electricity in Medicine' 1887, p. 427).

The percutaneous method is, however, not at all satisfactory; on the contrary, its results are very imperfect, as probably most of those who *ex-officio* practice electro-therapeutics in paralysis of the ocular muscles, can testify. The direct method moreover, is not at all as painful, as it is usually stated, if it is applied in a proper manner, and, furthermore, we have had in cocaine for the last two and a half years an excellent, and almost infallible remedy, by means of which we can, through the anæsthesia of the whole of the surface of the eyeball, reduce the local pain due to episcleral electrization to almost *nil.*

Since this action of cocaine has become known I use, according to Hirschberg's advice, the episcleral faradization and galvanization always in this way: I first instill a large quantity of a cocaine solution (2 to 5%) into the conjunctival sac, and five minutes afterwards, when the anæsthesia of the cornea and conjunctiva is already established, I instill it a second time in the same manner. Then the electrode for the ocular muscle which I shall describe presently (with the circuit not closed), is brought rapidly into place, while the indifferent electrode in the shape of a large round plate (fifty square centimetres) is applied to the sternum or held in the hand. The current is gradually raised to the desired intensity, which in

galvanization may be directly ascertained from the absolute galvanometer. The electrode for t e ocular muscles (made by W. A. Hirschmann, Berlin) consists of a pliable oval platinum plate, eight millimetres long and six wide, which is attached to a narrow rod, twenty millimetres long, which is held in a brass grip. This electrode has a handle, ten centimetres long, to which the conducting wire-rope is attached by means of a screw. It is furthermore arranged in such a manner, that by pressing down a knob, which ordinarily is held raised by a spiral spring, the metallic contact and the closing of the circuit may be produced for any desired period.

With this instrument the sessions lasted under cocaine anæsthesia from one to two minutes, and I have not seen any bad consequences from using induced currents which were strong enough to produce contractions of the orbicularis palpebrarum, or even of the more distant facial muscles (frontalis and corrugator). During galvanization (the anode on the eyeball) the intensity of the current, as measured by means of Hirschmann's astatic absolute vertical galvanometer, was, as a rule, one half to one milliampère; in some cases it was even more, so that I often produced a galvano-optical reaction when increasing or decreasing the current.

In spite of this relatively large intensity and density of the current (D with $^1/_2$ milliampère intensity = 1) I was to my astonishment never able, even when the muscular apparatus was perfectly healthy, to produce visible excursions of the eyeball in the direction of the muscle which was directly irritated by means of the local application of the faradic or galvanic current. This negative result was so constant that I must express a decided doubt in the several adverse statements of older authors, and am forced to consider them based on errors of observation which are probably due to the restless and irregular movements of the eyeball when irritated without anæsthesia. The non-success of this episcleral irritation, I further think, is easily explained by the physical conditions (of conduction and resistance).

It is well known that the amount of water in the eyeball

when compared with that in the neighboring tissues, is very large. According to Gorup-Besanez, the amount of water in the eyeball (dried by 110° Celsius) is 90%, while that in the neighboring connective and muscular tissues is only 71.5%. The resistance of the eyeball, as shown by von Ziemssen, is about $2^1/_2$ times smaller than that of the muscle, and only slightly smaller than that of fresh, moist brain tissue.

It is, therefore, natural that the current after passing through the sclerotic will especially spread in the moist tissues of the eyeball, while the muscles, containing so much less water, can only be reached by weak side-currents. To this we must add that the position of the ocular muscles is especially unfavorable to electrization, since on account of their site and the manner of their attachment it is probable, that only the tendinous portions lying in Tenon's capsule can be reached by the current while of sufficient density, and not those muscular fibres which run along the walls of the orbit and to the posterior pole of the eyeball, nor much less their motor nerves at their entrance into these muscles.

In this way it is impossible to hope for an especial diagnostic and prognostic usefulness of the direct irritation of the ocular muscles as explorative means in the paralysis of these muscles. Yet, this method is to be given the decided preference as a therapeutic means in peripheral ophthalmoplegia, since it is in better accord than the percutanous method with the generally adopted principle, to apply the electrization as much as possible *in loco morbi*. Its effect, moreover, can easily be proven by the usual criteria, the increase of absolute motility and the decrease in the size of the field in which the double images appear after the session.

I have also, aside from the cases of more recent and intermittent paralyses of the oculomotor and abducens nerves, seen favorable results from this method in cases of copiopia in neurasthenic and hysterical individuals.

DEATH OF HOFRATH PROF. FERDINAND VON ARLT.

The 7th of March, 1887, Ferdinand von Arlt, the Nestor of ophthalmology, the justly celebrated teacher and brilliant operator died of gangrene of the leg.

The International Medical Congress.

The following communication is received from the Committee of Arrangements and published for the information of persons desiring to attend the Ninth Meeting of the International Medical Congress in Washington, D. C., in 1887.

RATES OF TRANSPORTATION.

Red Star Line, $100; Antwerp to New York and return.

Inman Line, $100; Liverpool to New York and return.

Hamburg Line, $90; Hamburg to New York and return.

Royal Netherlands, $80; Amsterdam to New York and return.

North German Lloyd Line, $187.50; Bremen to New York and return.

Same rates are allowed for the families of members.

Cunard Line, 10 per cent. reduction for members of the Congress only.

HOTEL RATES IN WASHINGTON.

Arlington Hotel, from $3 to $3.50 per day.

Riggs House, from $3 to $3.50 per day.

Willard's Hotel, from $3 to $3.50 per day.

Metropolitan Hotel, $3 per day.

National Hotel, $3 per day.

Other Hotels conducted on European style will furnish rooms at $1 to $2 a day. Good lodging houses will also furnish rooms from $1 to $1.50 per day.

Proper accommodations have been secured for the meeting places of the Congress and its Sections.

Transportation within the limits of the United States has not yet been determined upon, but will soon be made public. Particulars of the plan of entertainments will be published in the official programme, and all notices will be published in due time.

A. Y. P. Garnett, *Chairman,*
C. H. A. Kleinschmidt, *Secretary.*

Section of Ophthalmology.

We are glad to be able to announce to our readers that the number of prominent men who have promised to take part in the work of the Section of Ophthalmology of the coming International is growing steadily.

Among those who are coming from Europe and have accepted positions as vice-presidents are: Dr. Hirschberg, Berlin; Dr. DeWecker, Paris; Dr. Landolt, Paris; Dr. Mauthner, Vienna, etc. From England, Drs. Brailey, Powers and Hewetson.

Among the American ophthalmologists who hold honorable positions in our section or have promised attendance and papers are the following well known gentlemen:

Drs. Hotz, Howe, Heyl, Keyser, Calhoun, Reynolds, Baldwin, Ferrer, Connor, Gardner, Marmion, Minor, Sanders, Fryer, Thompson, Sinclair, Smith, and a number of others.

The success of the Section of Ophthalmology is thereby abundantly assured.